In the Claims:

Please amend the Claims as follows:

1. (Previously Presented) An apparatus for co-registration of multi-modal images in a three-dimensional environment, the apparatus comprising:

a source of excitation light;

a one-way mirror having a transmissive side disposed towards the excitation light for transmitting the excitation light and a reflective side for reflecting light received from a target;

an electromagnetic-ray source disposed relative to the source of excitation light;

an electromagnetic-ray transparent mirror having a light-reflective surface disposed towards a reflecting side of the one-way mirror and an electromagnetic-ray transmissive surface disposed towards the electromagnetic-ray source;

a target location disposed towards the light-reflective surface of the electromagnetic-ray transparent mirror for locating a target and receiving the excitation light and the electromagnetic-rays;

an electromagnetic-ray detector disposed on an opposite side of the target location relative to the electromagnetic-ray source for detecting electromagnetic-rays transmitted through the target; and

a light detector disposed towards the reflective side of the one-way mirror for detecting light from the target,

wherein the electromagnetic-ray wavelength is shorter than the wavelength of the light.

2. (Original) An apparatus as defined in Claim 1 wherein the electromagnetic-ray source emits X-rays.

3. (Original) An apparatus as defined in Claim 1 wherein the source of excitation light emits at least one of optical, fluorescent, coherent, diffusive and transmissive light.

4. (Original) An apparatus as defined in Claim 1 wherein the light detector detects at least one of emitted and reflected light from the target.

5. (Currently Amended) An apparatus for co-registration of multi-modal images in a three-dimensional environment, the apparatus comprising:

a source of excitation light;

an electromagnetic-ray source disposed relative to the source of excitation light;

an electromagnetic-ray transparent mirror having a first surface disposed towards the excitation light and a second surface disposed towards the electromagnetic-ray source;

a target location disposed towards the first surface of the electromagnetic-

ray transparent mirror for locating a target and receiving the excitation light and the electromagnetic rays;

an electromagnetic-ray detector disposed on an opposite side of the target location relative to the electromagnetic-ray transparent mirror for detecting electromagnetic-rays transmitted through the target;

a second electromagnetic-ray transparent mirror having a light-reflective surface disposed towards the target location; ~~and~~

a light detector disposed towards the light-reflective surface of the second electromagnetic-ray transparent mirror for detecting light from the target; and

a controller in signal communication with the source of excitation light for illuminating a target point with excitation light by capturing electromagnetic-ray image data of a scene from the electromagnetic-ray detector, identifying electromagnetic-ray image data associated with the target point, and projecting a beam of excitation light responsive to the electromagnetic-ray image data at the target point by converting image coordinates of the target point to light coordinates for directing the beam of excitation light, and processing the light coordinates to direct the beam of excitation light to the target point,

wherein the electromagnetic-ray wavelength is shorter than the wavelength of the light.

6. (Original) An apparatus as defined in Claim 5 wherein the electromagnetic-ray source emits X-rays.

7. (Original) An apparatus as defined in Claim 5 wherein the source of excitation light emits at least one of optical, fluorescent, coherent, diffusive and transmissive light.

8. (Original) An apparatus as defined in Claim 5 wherein the light detector detects transmitted light from the target.

9. (Original) An apparatus as defined in Claim 5, further comprising a mirror disposed towards the excitation light for at least one of reflecting and redirecting the excitation light.

10. (Original) An apparatus as defined in Claim 5, further comprising a mirror disposed towards the light-reflective surface of the second electromagnetic-ray transparent mirror for at least one of reflecting and redirecting the light from the target to the light detector.

11. (Original) An apparatus as defined in Claim 5, further comprising at least one of gimbals and tracks for rotating the apparatus about a centrally disposed target.

12. (Currently Amended) A method for co-registration of multi-modal

images in a three-dimensional environment, the method comprising:

defining a frame of reference;

providing electromagnetic-rays to a target relative to the frame of reference;

detecting electromagnetic-rays transmitted by the target relative to the frame of reference;

detecting light from the target relative to the frame of reference;

providing co-registered electromagnetic-ray and light images of the target to a user; and

providing excitation light to a point on the target relative to the frame of reference by capturing electromagnetic-ray image data, identifying electromagnetic-ray image data associated with the point on the target, and projecting a beam of excitation light responsive to the electromagnetic-ray image data at the point on the target by transmitting the excitation light through a non-reflecting side of a one-way mirror and reflecting light received from a target from a reflecting side of the one-way mirror,

wherein the electromagnetic-ray wavelength is shorter than the wavelength of the light.

13. (Original) A method as defined in Claim 12, further comprising redirecting the light to be detected from the target without redirecting the electromagnetic-rays to be detected from the target.

14. (Canceled)

15. (Previously Presented) A method as defined in Claim 12, further comprising redirecting the excitation light relative to the target without redirecting the provided electromagnetic-rays.

16. (Original) A method as defined in Claim 12, further comprising:

capturing X-ray image data; and

identifying X-ray image data associated with the target.

17. (Currently Amended) A method for co-registration of multi-modal images in a three-dimensional environment, the method comprising:

defining a frame of reference;

providing electromagnetic-rays to a target relative to the frame of reference;

detecting electromagnetic-rays transmitted by the target relative to the frame of reference;

detecting light from the target relative to the frame of reference; ~~and~~

providing co-registered electromagnetic-ray and light images of the target to a user; and

providing excitation light to a point on the target responsive to the co-

registered electromagnetic-ray image relative to the frame of reference,

wherein providing excitation light comprises:

converting image coordinates of the target into light coordinates for directing the excitation light; ~~and~~

processing the light coordinates to direct the excitation light to the point on the target in a real scene;

transmitting the excitation light through a non-reflecting side of a one-way mirror; and

reflecting light received from a target from a reflecting side of the one-way mirror.

18. (Currently Amended) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform program steps for co-registration of multi-modal images in a three-dimensional environment, the program steps comprising:

defining a frame of reference;

providing electromagnetic-rays to a target relative to the frame of reference;

detecting electromagnetic-rays transmitted by the target relative to the frame of reference;

detecting light from the target relative to the frame of reference;

providing co-registered electromagnetic-ray and light images of the target

to a user; and

providing excitation light to a point on the target relative to the frame of reference by capturing electromagnetic-ray image data, identifying electromagnetic-ray image data associated with the point on the target, and projecting a beam of excitation light responsive to the electromagnetic-ray image data at the point on the target by transmitting the excitation light through a non-reflecting side of a one-way mirror and reflecting light received from a target from a reflecting side of the one-way mirror,

wherein the electromagnetic-ray wavelength is shorter than the wavelength of the light.

19. (Original) A program storage device as defined in Claim 18, the program steps further comprising redirecting the light to be detected from the target without redirecting the electromagnetic-rays to be detected from the target.

20. (Canceled)

21. (Previously Presented) A program storage device as defined in Claim 18, the program steps further comprising redirecting the excitation light relative to the target without redirecting the provided electromagnetic-rays.

22. (Original) A program storage device as defined in Claim 18, the

program steps further comprising:

capturing X-ray image data; and

identifying X-ray image data associated with the target.

23. (Currently Amended) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform program steps for co-registration of multi-modal images in a three-dimensional environment, the program steps comprising:

defining a frame of reference;

providing electromagnetic-rays to a target relative to the frame of reference;

detecting electromagnetic-rays transmitted by the target relative to the frame of reference;

detecting light from the target relative to the frame of reference; ~~and~~

providing co-registered electromagnetic-ray and light images of the target to a user; and

providing excitation light to a point on the target responsive to the co-registered electromagnetic-ray image relative to the frame of reference,

wherein the program step of providing excitation light comprises:

converting image coordinates of the target into light coordinates for directing the excitation light; ~~and~~

processing the light coordinates to direct the excitation light to the point on

the target in a real scene;

transmitting the excitation light through a non-reflecting side of a one-way mirror; and

reflecting light received from a target from a reflecting side of the one-way mirror.